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28 March 2017

Melanie Morash
Remedial Project Manager
U.S. Environmental Protection Agency
Region 9
75 Hawthorne Street (SFD-7-1)
San Francisco, CA 94105

RE: Investigation Findings for Residences 035, 203, 211, 209, 034, 043, 210, 208, 202, 206, 059, and 036
Sunnyvale Triple Site
Locus Project No. 27006-08-9016

Dear Ms. Morash:

This letter provides a summary of activities related to the TCE source investigation conducted at Residences 035, 203, 211, 209, 034, 043, 210, 208, 202, 206, 059, and 036 (the apartment building) in Sunnyvale, California, from January through March 2017.

Summary of Actions

As background, the subject one story building contains fourteen apartments (see attachment). Indoor air from the apartment building has been sampled since 2015. The maximum indoor air TCE in Units 10-12 prior to sampling in 2017 was 0.44 µg/m^3 (in Unit 12). Additionally, prior to sampling in 2017, all data from the apartment building was below the short term screening level of 2.0 µg/m^3.

The source investigation activities at the apartment building were initiated following the detection of elevated concentrations of TCE in Unit 12 on 10 January 2017, which exceeded the urgent action screening level for TCE (6.0 µg/m^3). The response actions taken are detailed on the attached source investigation diagram including event dates, sampling locations, and TCE data obtained. The following is an overview of events.

Several rounds of indoor air confirmation sampling took place throughout the investigation. Gaps around conduits under kitchen and bathroom sinks were sealed to eliminate this potential vapor pathway on 16-17 February. On the same dates, apartment units were ventilated and household chemicals stored under sinks with

potential VOC contents were contained and quarantined outdoors on the same dates. A HAPSITE unit was brought onsite on behalf of the EPA for screening the indoor air of all accessible apartment units on 21 February. Based on the HAPSITE concentrations in Units 10-12 (up to 230 µg/m^3 in Unit 11) and results received from EPA's 24-hour passive samplers deployed on 16 February (exceeding the urgent action screening level of 6.0 µg/m^3 in Units 10-12), indoor air purifying units were installed in those apartments on 22 February. Ultimately, all fourteen apartments in the building were offered indoor air purifying units, regardless of the initial sampling results obtained.

In addition to indoor air evaluations, VAPOR PINs were installed in Units 5, 10, 11, 12, 14 and the laundry room to evaluate sub-slab concentrations on 1 March. SUMMA canister samples were collected the same day from Units 11 and 12. A TCE concentration of 0.60 µg/m^3 was observed under Unit 12. Concentrations ranged from 1.8 µg/m^3 to 21 µg/m^3 under Unit 11.

An additional HAPSITE mobilization took place on 2-3 March to screen household items and selected drain pipes in Unit 11 as well as the sanitary sewer on the property. A maximum TCE result of 4,300 µg/m^3 was observed from HAPSITE screening in Unit 11, which was found in the laundry basket containing used work clothes of the tenant (from the tenant's previous day at work assembling fire sprinkler systems). The tenant confirmed that he uses glues and solvents in his work and had also brought home some of these materials from his work.

The HAPSITE screening result from the sanitary sewer cleanout was non-detect; the maximum screening result from the drain pipes at Unit 11 was 3.9 µg/m^3, similar to the indoor concentrations measured in the unit on that day. Sub-slab samples from Units 11, 12, and the laundry room were screened with the HAPSITE unit during the same mobilization. Sub-slab soil gas screening results ranged from 1.1 µg/m^3 to 58 µg/m^3, with a maximum of 3.4 µg/m^3 under units other than Unit 11. Since the concentrations found in the vapor pins were substantially higher under Unit 11 compared to the rest of the building, that difference was attributed to the identified sources within that unit. HAPSITE screening was conducted in accordance with Amendment 1 of the Additional Vapor Intrusion Evaluation Work Plan dated 1 March 2017.

The week of 6 March, shallow soil gas, groundwater levels, and groundwater samples were collected from four temporary soil gas monitoring wells (SGS-1, SGS-2, SGS-3, and SGS-4) and four temporary groundwater collection borings (GW-1, GW-2, GW-3, and GW-4). TCE in shallow soil gas samples was detected in only one of the four temporary wells with a result of 1.3 µg/m^3. TCE in groundwater was detected in only two of the four borings with results of 1.4 µg/L and 4.0 µg/L. Notably, TCE in the soil

gas well and groundwater borings just outside of Unit 11 were both below detection. This mobilization was conducted in accordance with Amendment 2 of the Additional Vapor Intrusion Evaluation Work Plan dated 3 March 2017.

Findings

Elevated indoor air TCE levels at the apartment building appear to be from an above-ground source rather than vapor intrusion, based on the following lines of evidence:

- Several of the items from Unit 11 were found to be offgassing TCE at substantial concentrations, up to 4,300 µg/m^3. With the unit being closed during the day, the offgassing of TCE from these items very likely created the indoor ambient concentration at the measured concentrations of 200-300 µg/m^3 in the unit.
- Groundwater concentrations beneath this property range from below detection up to 4 µg/L. These concentrations place this property outside the Offsite Operable Unit plume boundaries, and therefore most likely do not contribute any significant vapor intrusion to the indoor air concentrations measured at this property.
- Shallow soil-gas concentrations beneath this property were below detection, except for one location which measured 1.3 µg/m^3. Soil-gas concentrations at this level would not have the potential to cause the indoor air concentrations measured at this property.
- Elevated sub-slab vapor concentrations were found only beneath Unit 11, and therefore those concentrations appear to be originating from the sources within that unit.

Next Steps

The data collected from this property strongly indicates that an indoor source is present, and that there is negligible potential for vapor intrusion based on the soil-gas and groundwater data. Indoor air concentrations in 2015 from other units in this building have also shown the absence of vapor intrusion concern for this property.

We have been informed that the tenant in Unit 11 is moving out of the apartment, and concentrations are likely to slowly decline after those source materials have been removed. However, there will remain some offgassing from carpet and any other organic materials in the building. Based on the significant concentrations found inside the unit during this investigation, it is expected to take several months before the effect of those indoor sources is fully removed.

The vapor intrusion pathway for this property has been fully evaluated with the investigations described above, and there appears to be negligible potential for vapor intrusion. Therefore, no further investigation or mitigation activities are warranted.

Locus proposes to remove the portable air purifiers from the building, and seal all vapor pin locations to return the property to original condition.

Sincerely,

J. Wesley Hawthorne, PE, PG
President

JWH/njl,lo

cc: Robert Ariatti, Northrop Grumman
Shau-Luen Barker, Philips Semiconductors
Peter Bennett, Haley & Aldrich
Michael Calhoun, Haley & Aldrich
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James Lesperance, Northrop Grumman
Leslie Lundgren, CB&I
Todd Maiden, Reed Smith LLP
Shaun Moore, AMD
Linda Niemeyer, Northrop Grumman
Heather O'Cleirigh, AMD
Peter Scaramella, Haley & Aldrich

ATTACHMENT

Source Investigation Findings
Last Revised 23 March 2017

Apt 1

Date	Comment
2/7	AMB 0.22 9 Day- AMB 0.19
2/16	Wall Sealing, Ventilation, Chemical Quarantine AMB 0.18 TO15 SUMMA grab- AMB ND
2/21	AMB 0.32 PATH 0.34-0.61 SRC-1 0.75 (PCE 1500 S) HAPSITE screen- AMB ND

Apt 2

Date	Comment
2/6	AMB 1.5 14 Day- AMB 0.97
2/16	Wall Sealing, Ventilation, Chemical Quarantine AMB 0.89 TO15 SUMMA grab- AMB ND
2/21	AMB 0.42 PATH 0.42-1.4 SRC-1 0.27 7 Day - AMB 0.14 J PATH 0.15 J-0.39 HAPSITE screen- AMB ND PATH 3.3
2/22	AMB 0.11 PATH 0.14-0.36
2/24	Purifier Install
2/27	4 Day- AMB 0.23J PATH 0.28-0.31
3/1	electrical obstacle for proposed VAPOR PIN

Apt 3

Date	Comment
2/17	Wall Sealing, Ventilation, Chemical Quarantine

Apt 4

Date	Comment
2/23	AMB 3.2 PATH 4.5-6.2

Apt 5

Date	Comment
2/17	Wall Sealing, Ventilation, Chemical Quarantine
2/21	AMB 1.0 PATH 1.0-1.4 6 Day- AMB 0.31 PATH 0.33-0.38 HAPSITE screen - AMB 3.3 PATH 2.1
2/22	AMB 0.33 PATH 0.44-0.57
2/24	Purifier Install
2/27	4 Day- AMB 0.22J PATH 0.4-0.78
3/1	VAPOR PIN Installed

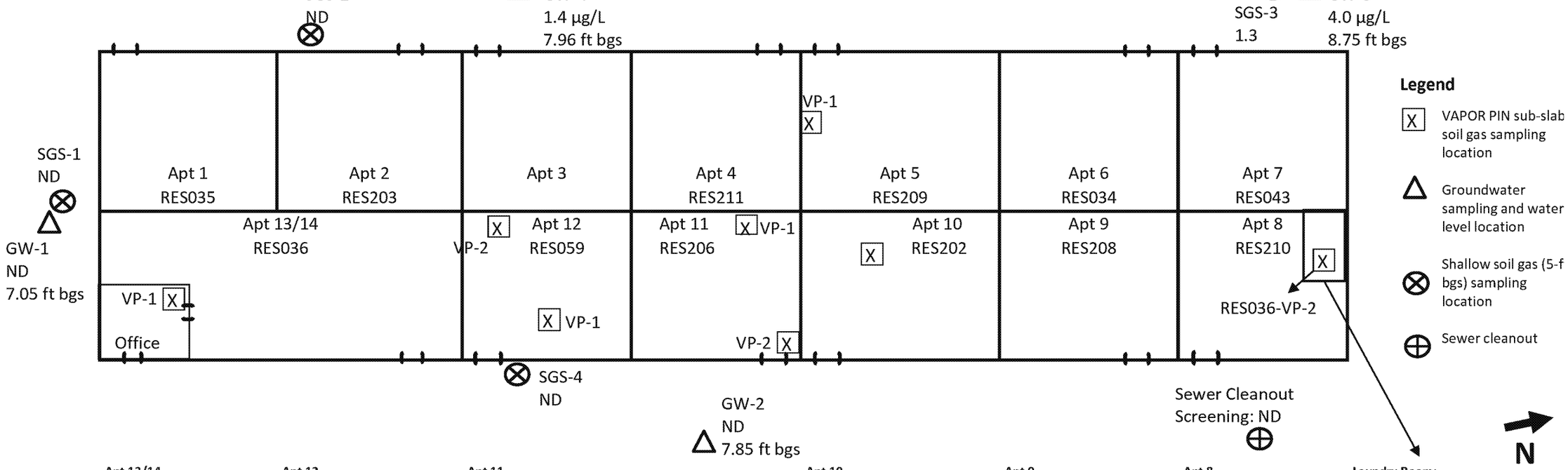
Apt 6

Date	Comment
2/7	AMB 0.30 9 Day- AMB 0.34
2/16	Wall Sealing, Ventilation, Chemical Quarantine AMB 0.51 TO15 SUMMA grab- AMB 0.14J
2/21	AMB 0.35 PATH 0.56-0.69 SRC-1 0.32 HAPSITE screen- AMB ND 10 Day- AMB 0.36 PATH 0.73

Apt 7

Date	Comment
2/6	10 Day- AMB 0.14
2/16	Wall Sealing, Ventilation, Chemical Quarantine TO15 SUMMA grab- AMB ND
2/21	AMB 0.33 PATH 0.29-0.34 SRC-1 0.30 10 Day- AMB 0.13 PATH 0.14 HAPSITE screen- AMB ND
2/24	Purifier Install

Outdoor Air
2/7 0.15
2/16 0.36
2/21 0.36-0.40
2/22 0.89
2/23 0.46
2/27 0.51-0.91
2/28 0.99
3/1 1.3
3/3 1.7



Apt 13/14

Date	Comment
2/7	AMB 0.095 10 Day- AMB 0.13-0.14
2/17	Wall Sealing, Ventilation, Chemical Quarantine
2/21	AMB 0.32-0.35 PATH 0.35-0.37 10 Day- AMB 0.36 PATH 0.35-0.39 HAPSITE screen- AMB ND PATH ND
2/24	Purifier Install
2/27	4 Day- AMB 0.37
3/1	VAPOR PIN Installed

Apt 12

Date	Comment
1/10	AMB 6 14 Day- AMB 6.8
2/6	AMB 13 PATH 37 E 10 Day- AMB 8.0 PATH 20
2/16	Wall Sealing, Ventilation, Chemical Quarantine AMB 7.3 PATH 11.0 TO15 SUMMA grab- AMB 0.56
2/21	HAPSITE screen- AMB 2.3
2/22	Purifier Install; AMB 0.59-0.61 PATH 0.84-4.8
2/27	Ventilation, Purifier Replaced; AMB 0.42 PATH 2.1 4 Day- AMB 0.49 PATH 0.49-0.84
2/28	AMB 0.26 PATH 0.32-0.49
3/1	2 VAPOR PINs Installed: Summa result 0.60 @ VP1; AMB 0.33-0.40 PATH 0.42-0.43
3/3	Screen VAPOR PINs: 1.1 @ VP1, 3.4 @ VP2

Apt 11

Date	Comment
2/16	Wall Seals OK, Ventilation, Chemical Quarantine AMB 230 J - 240 J
2/21	AMB 130 EQ PATH 130E - 200S SRC-1 17 SRC-2 4.3 HAPSITE screen- 100-230
2/22	Purifier Install; AMB 46 PATH 59-70 SRC-2 4.3 SRC-3 2.4
2/23	AMB 28-29 E PATH 47 E - 48 E
2/27	Ventilation, Purifier Replaced; AMB 5.7 PATH 3.2-6.3 3 Day- AMB 13 PATH 9.7-30
2/28	AMB 23 PATH 21 - 51 E
3/1	2 VAPOR PINs Installed: Summa results 21 @ VP1, 1.8 @ VP2;
3/2	Screen Belongings: high of 101 in laundry products and cleaning products
3/3	Screen Belongings: high of 4,300 in work clothes; Screen Sewer: high of 3.9; Screen VAPOR PINs: 58 @ VP1, 9.1 @ VP2; Sample Hot Belongings with Radiellos: high of 1,700 E in work clothes

Apt 10

Date	Comment
2/6	AMB 7.5 10 Day- PATH 18
2/16	Wall Sealing, Ventilation, Chemical Quarantine AMB 8.2 TO15 SUMMA grab- AMB 0.45
2/21	AMB 2.0 PATH 1.9-2.0 6 Day- AMB 0.9 PATH 1.5-1.9 HAPSITE screen- AMB 7.5
2/22	Purifier Install; AMB 2.8 PATH 1.2-5.4
2/23	AMB 0.94 PATH 1.3-2.5
2/27	Ventilation, Purifier Replaced; AMB 0.52 PATH 2.3-4.4 4 Day- AMB 0.75-0.91 PATH 1.4-4.3
2/28	AMB 1.0-1.1 PATH 2.6
3/1	VAPOR PIN Installed; AMB 1.1 PATH 2.4-6.2

Apt 9

Date	Comment
2/17	Wall Sealing, Ventilation, Chemical Quarantine AMB 8.2
2/21	AMB 0.98 PATH 0.90-1.0 4 Day- PATH 1.2 HAPSITE screen- AMB ND PATH ND
2/28	Purifier Install
3/1	no access for proposed VAPOR PIN

Apt 8

Date	Comment
2/17	Wall Sealing, Ventilation, Chemical Quarantine
2/21	AMB 0.74-0.87 PATH 0.58-0.61 SRC-1 0.22 4 Day- AMB 0.15 PATH 0.15 HAPSITE screen- AMB ND
2/24	Purifier Install

Laundry Room:

Date	Comment
2/21	AMB 0.34 6 Day- AMB 0.53 HAPSITE screen- AMB ND
2/27	4 Day- AMB 0.51-0.57
3/1	VAPOR PIN Installed
3/3	Screen VAPOR PIN 1.6

NOTES:

All analytical data are TCE and in units of µg/m3 unless otherwise noted

AMB = ambient sample; PATH = pathway sample; AMB and PATH and Outdoor air results are 24-hour passive Radiello samples unless otherwise noted.

Wall Sealing - entailed sealing of over-sized holes in wall at location of under-sink piping (in bathroom and/or kitchen, as needed)

Chemical Quarantine - if no suspect chemicals were identified, none were removed from apartment

Purifier Install - entailed install of Air Pura C600 DLX air purifier; units set on high for initial operation

VAPOR PIN - sampling port for sub-slab soil gas sampling, installed flush with slab for repeat sampling

Screen Belongings - entailed HAPSITE (mobile GC/MS) screening for TCE and PCE in personal belongings of unit 11 residents

Screen Sewer - entailed HAPSITE (mobile GC/MS) screening of bathroom and kitchen sewer pipes following draining of U-trap

Screen Sewer Cleanout - entailed HAPSITE (mobile GC/MS) screening of sewer cleanout at presumed combined sewer discharge

Screen VAPOR PIN - entailed HAPSITE (mobile GC/MS) screening of sub-slab soil gas from VAPOR PIN

E = exceeds instrument calibration range

ND = non-detect

Q = exceeds quality control limits

S = saturated peak; data reported as estimated

SRC = sample from quarantined chemicals in bin

J = The reported result is an estimate. The value is less than the minimum calibration level but greater than the estimated detection limit (EDL)